한국동물분류학회지 제17권 제2호
The Korean Journal of Systematic Zoology
Vol. 17, No. 2: 223-228 (October 2001)

A New Species of the Genus *Cauloramphus* (Bryozoa, Cheilostomata) from Korea

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ABSTRACT

A new species of anascan Bryozoa, *Cauloramphus korensis*, is described from two localities of the Yellow Sea, Korea. The new species is similar to *C. spiniferum* in the characteristics of cryptocyst, the location of distal spines, distal crescentic cap and more or less perpendicular proximal spines, but can easily be distinguished by the presence of brown spines, rare distal spines and hooked rostrum. The genus *Cauloramphus* is newly reported from Korea.

Key words: a new species, anascan Bryozoa, *Cauloramphus*, Korea

INTRODUCTION

The species belonging to the genus *Cauloramphus* of which fourteen have been reported from around the world oceans so far. They include *Cauloramphus brunnea* (Canu and Bassler, 1930), *C. californiensis* (Soule, Soule and Chaney, 1995), *C. costatus* (Silén, 1942), *C. cymbaeformis* (Hincks, 1887), *C. disjunctus* (Canu and Bassler, 1929), *C. echinus* (Hincks, 1882), *C. intermedius* (Kluge, 1962), *C. japonicus* (Silén, 1942), *C. magnus* (Dick and Ross, 1988), *C. opertus* (Canu and Bassler, 1928), *C. pseudospiniferum* (Androsova, 1958), *C. spectabilis* (Dick and Ross, 1988), *C. spiniferum* (Johnston, 1832) and *C. variegatum* (Hincks, 1884) (Mawatari and Mawatari, 1981; Dick and Ross, 1988; Horowitz, 1993; Soule, Soule and Chaney, 1995). Five of them, *C. costatus*, *C. cymbaeformis*, *C. disjunctus*, *C. japonicus* and *C. spiniferum* were

This study was supported by Woosuk University.
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also found from Japan (Mawatari and Mawatri, 1981). None of them have been reported from Korea.

The genus *Cauloramphus* is also new to Korean fauna. This genus is characterized by the shape of avicularium and the number of spines. Most of the *Cauloramphus* species show the pedunculate avicularium, well-developed distal spines group and numerous proximal spines. The new species is typical one of the genus, but it shows significant differences in numbers and color of spines compared with closed species. With regard to the distribution of *Cauloramphus* species, *C. magnus*, *C. pseudospiniferum*, *C. spectabilis* and *C. intermedius* are boreal species reported from Alasca or Arctic Seas (Kluge, 1962; Dick and Ross, 1988). *C. brunnea* and *C. opertus* are tropical species (Canu and Bassler, 1928; Soule, Soule and Chaney, 1995). *C. costatus* and *C. japonicus* were only known from Japan (Silén, 1941; Androsova, 1958). *C. cymbaeformis*, *C. disjunctus*, *C. pseudospiniferum* and *C. spiniferum* were reported from the northern part of the Sea of Japan (Androsova, 1958). *C. spiniferum* is a circumboreal species, but Dick and Ross (1988) mentioned that its range in the eastern Pacific needs to be reexamined because of the uncertainty associated with previous records. The known range of *C. variegatum* is from Alaska to California (Osburn, 1950; Dick and Ross, 1988), and *C. californiensis* and *C. echinus* are reported from California (Soule, Soule and Chaney, 1995).

The specimens were collected from two localities of the Yellow Sea, Korea. They were fixed and stored with 40% neutral formalin solution after narcotization with menthol in the field. For identification, the fragments taken from substratum were burned with an alcohol lamp and observed under a stereomicroscope. The scanning electron micrographs were used to give the detailed structural characteristics.

The specimens examined are deposited in the Department of Biology, Woosuk University.

SYSTEMATIC ACCOUNTS

Phylum Bryozoa Ehrenberg, 1831 태형동물문
Class Gymnolaemata Allman, 1856 나후강
Order Cheilostomata Busk, 1852 순구목
Suborder Anasca Levinsen, 1909 유낭아목
Family Calloporidae Norman, 1903 단단이끼벌레과
Genus *Cauloramphus* Norman, 1903 자루조두체이끼벌레과(신칭)

***Cauloramphus korensis* n. sp.** 갈색가시이끼벌레 (신칭) **(Fig. 1)**

Material examined. Holotype was collected from Gyokpo (5 m deep) of the Yellow Sea on November 3, 1996 by a SCUBA diver. The specimens were encrusting the shell of an abalone. Paratypes: Two more abalone shells which the colonies were encrusting were collected from the same locality. Other collections were done from Chaesukgang of Gyokpo on May 3, 1997 by the author and H. J. Kil, and from Gobongpo of Baekryongdo Island on August 20, 2000 by S. Shin. The former specimens were encrusting the shell of molluscs and the latter encrusting the shell of molluscs and stone.

Description. Colony encrusting substratum by the basal surface of the zooecia, unilaminar, dark

brown. Zooids closely set with each other, irregularly arranged, irregularly ovoid with a well defined-groove between them, averaging 523 μm long by 318 μm wide. Distal to the orifice, transverse crescentic cap much raised above the level of mural rims. Several dietellae in each lateral wall are shown. Opesia measuring 401 μm long. Cryptocyst narrow distally, coarsed granulated, wider proximally sloping up to the mural rim bearing 5-9 brown or violet spines, mostly 6-7 in number. Gymnocyst almost lacking, but in some zooids it tapers back between preceding zooids. Spines 133 μm in length, acuminate, more or less curved over opesia but never overarching. Distal spines rarely shown, but some zooids have 1-3, usually shorter and thinner than proximal spines. When 1 spine is present, it is located at the midline. 2 spines on the distal margin of crescentic cap, 3 distal spines placed in a triangle, one at the midline and one to each side of the orifice. Spine bases are also brown or violet. Pedunculate avicularia 167 μm, not abundant, not long and slender, slightly longer than spines, narrowed basally and swollen to a characteristic club shape at the tip, single or paired, white, located outside of spines on lateral edge of mural rim, in line with proximal edge of orifice, directed inward and upward, but sometimes outward, rostrum hooked. Ovicells not seen.

Etymology. Named for the Korea type locality.

Remarks. This new species is the most similar to *C. spiniferum* described by Dick and Ross (1988) in the characteristics of cryptocyst, the location of distal spines, distal crescentic cap and more or less perpendicular proximal spines. However, the brown spines and hooked rostrum of new species are clearly different from *C. spiniferum* of Alasca. They placed *C. spiniferum* with the brown spines in Osburn (1950)'s specimen into *C. variegatum*. However, our specimens show the differences from *C. variegatum* by the features that it has 6 blunt distal spines and 2-6 thin proximal spines. The other characteristic feature of this new species is rare distal spines. The diatal spines in our specimens were hardly found as in *C. japonicus* having a short straight, blunt spine on each side distal to the avicularia (Silén, 1941) and rarely showing a small distal pair of erect spines in some zooecia (Mawatari and Mawatari, 1981). It is very unusal that these two species show the rare distal spines, compared with other species belonging to *Cauloramphus* with 3-6 developed distal spines group. However, this species is differentiated from *C. japonicus* having a paired small tubular avicularium and 8 pairs of spines.

The shallow crescentic cap just distally to the zooecium of our specimens is not likely to be ovicell because all of the zooids has this structure. Dick and Ross (1988) explained that it is present on all zooids and apparently not indicative of a brood chamber in *C. spiniferum*, whereas Ryland and Hayward (1977) and Mawatari and Mawatari (1981) described it is a reduced ovicell.

Dick and Ross (1988) reviewed other descriptions of *C. spiniferum* about the variable number of spines. However, their specimens with 3 distal spines seems to be different from all the other specimens which have more than 10 spines and 4-6 thicker distal spines than proximal ones. They rather resemble our specimens in terms of the character of cryptocyst, the location of distal spines, crescentic cap and more or less perpendicular proximal spines. Thus *C. spiniferum* of Dick and Ross (1988) needs to be reexamined.

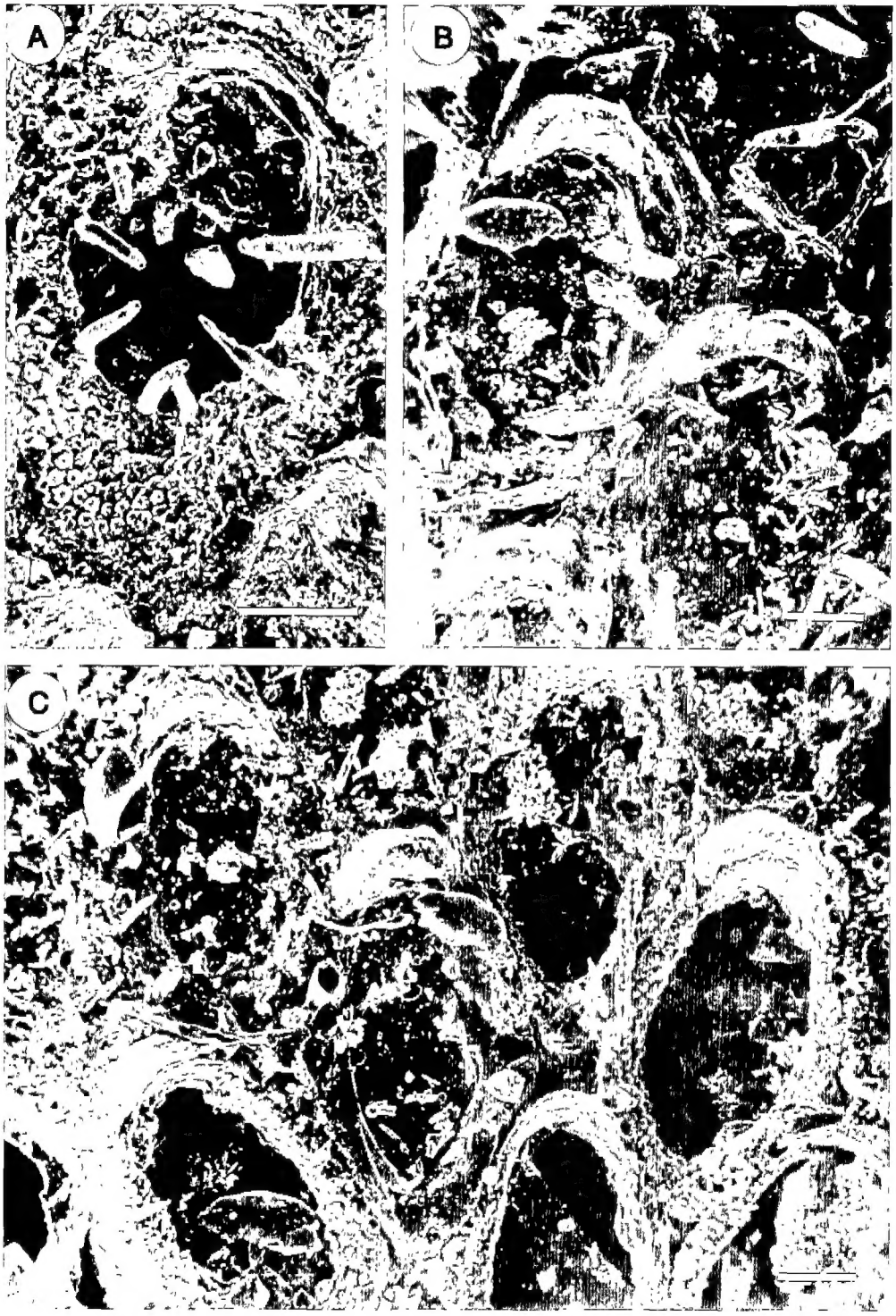

Fig. 1. *Cauloramphus korensis* n. sp. A, a zooid with 7 proximal spines; B, zooid showing distal crescentic cap and avicularia; C, hooked rostrum and distal spine. Scale bars are 100 μm.

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RECEIVED: 3 September 2001
ACCEPTED: 24 September 2001

한국산 자루조두체이끼벌레속(태형동물문, 순구목)의 1신종

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요 약

우리나라 황해의 격포와 백령도에서 채집된 무낭류 신종을 보고한다. 신종은 은벽의 특징, 원위 극의 위치, 충실구 위쪽의 초생달 모양 구조물과 극이 충실복벽을 향해 많이 굽어지지 않은 점 등이 *C. spiniferum*과 비슷하나, 갈색의 극, 흔치 않은 원위 극과 상악의 끝이 갈고리처럼 굽은 점이 확연히 다르다. 자루조두체이끼벌레속(*Cauloramphus*)은 한국에서 처음으로 보고된다.